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Keith A. Bell			SAXENA, AKASH	
ExxonMobil Upstream Research Company				
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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte CRAIG S. CALVERT, GLEN W. BISHOP, YUAN-ZHE MA,  
TINGTING YAO, J. LINCOLN FOREMAN, KEITH B. SULLIVAN,  
DWIGHT C. DAWSON and THOMAS A. JONES*

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Appeal 2008-0483  
Application 09/934,320  
Technology Center 2100

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Decided: March 3, 2008

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Before LANCE LEONARD BARRY, HOWARD B. BLANKENSHIP,  
and STEPHEN C. SIU, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

A Patent Examiner rejected claims 1-29. The Appellants appeal therefrom under 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

A. INVENTION

The invention at issue on appeal constructs a "geological model" a computer-based representation of a subsurface region of the Earth, e.g., a

petroleum reservoir or a depositional basin. Geologic models built for mining or petroleum applications generally comprise a three-dimensional array of individual model units or blocks. (Spec. 1.) Geologic modeling is the process of assigning values of the rock-properties of interest to all blocks within a geologic model. (*Id.* 2.)

The Appellants complain, "Prior art geologic modeling technologies do not properly account for different spatial scales of multiple diverse data types." (*Id.* 7.) In contrast, they assert that their invention "provides [a] model builder with the ability to integrate multiple data types . . ." (*Id.* 9.) According to their invention, "one or more frequency-passband models are constructed, combined, and then optimized to form [a] complete geologic model." (*Id.*)

#### B. ILLUSTRATIVE CLAIM

Claim 1, which further illustrates the invention, follows.

1. A method for constructing a three-dimensional geologic model of a subsurface earth volume according to specific geological criteria, comprising the steps of:

- (a) generating an initial frequency-passband model of the subsurface earth volume for at least one frequency passband;
- (b) assigning values for at least one rock property in each initial frequency-passband model;
- (c) combining the initial frequency-passband models to form an initial complete three-dimensional geologic model of the subsurface earth volume; and
- (d) optimizing the initial complete three-dimensional geologic model by perturbing the rock property values in at

least one of the models according to specified geological criteria.

#### C. REJECTIONS

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,049,759 ("Etgen") and U.S. Patent No. 4,679,174 ("Gelfand").

Claims 13-25 and 27-29 stand rejected under § 103(a) as obvious over Etgen; Gelfand; and U.S. Patent No. 5,838,634 ("Jones").

Claim 26 stands rejected under § 103(a) as obvious over Etgen, Gelfand, Jones, and the Appellants' admitted prior art ("AAPA").

#### II. INITIAL OBSERVATIONS

1 An Appellant's brief must include "[a] concise explanation of the subject matter defined in each of the independent claims involved in the appeal, which shall refer to the specification by page and line number, and to the drawing, if any, by reference characters." 37 C.F.R. § 41.37(c)(1)(v) (2006).<sup>1</sup> "[R]eference to . . . line number of the specification . . . is [always] considered important to enable the Board to more quickly determine where the claimed subject matter is described in the application." MPEP § 1205.02 (8th ed., 6th rev., Sep. 2007).

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<sup>1</sup> We cite to the version of the Code of Federal Regulations in effect at the time of the Supplemental Appeal Brief. The current version includes the same rules.

Here, although the Appellants' *Summary of the Claimed Subject Matter* cites to page numbers and drawing numbers (Supp. Br. 2-5), it does not refer to line numbers or reference characters. The Appellants should ensure that all their briefs cite to such line numbers and reference characters.

### III. ISSUE

"Rather than reiterate the positions of parties *in toto*, we focus on an issue therebetween." *Ex parte Kuruoglu*, No. 2007-0666, 2007 WL 2745820, at \*2 (BPAI 2007). The Examiner alleges, "*The step of assigning values for at least one rock property in each initial frequency-passband model is taught by Etgen '759 as assigning rock properties in the velocity model (Etgen '759: Col. 17 Lines 48-63, which has multiple frequency passband models (Etgen '759: Fig.3A)*" (Ans. 5.) The Appellants argue, "Etgen . . . does not disclose or suggest assigning the rock property values to the frequency slices." (Reply Br. 2.) Therefore, the issue is whether the Examiner has shown that Etgen assigns values for at least one rock property in at least one initial frequency-passband model.

### IV. LAW

"In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993) (citing *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992)). "'A *prima facie* case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.'"

*In re Bell*, 991 F.2d 781, 783 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976)).

## V. ANALYSIS

Here, the passage of Etgen relied on by the Examiner follows.

Each horizontal layer defines an interval of constant velocity within the model, but other rock parameters need not remain constant throughout the layer. Any rock property that is not used to compute the amplitude or travel time of the wave field may vary arbitrarily within a layer (i.e., the layer may be arbitrarily anisotropic, anisotropy being a term that is well known in the art and may be found defined in, by way of example, Sheriff, *Encyclopedic Dictionary of Exploration Geophysics*, Second Edition, Society of Exploration Geophysicists, 1984, on pages 8 and 9, the disclosure of which is incorporated by reference). On the other hand, rock parameters that are used to compute the amplitude or travel time of the wave field—e.g., P velocity, S velocity, attenuation/dissipation (Q), density, porosity, and permeability—may vary only in the depth direction for the V(z) embodiment.

(Col. 17, ll. 48-63.) Although this passage mentions a velocity model, V(z), we find no discussion therein of assigning rock properties in the velocity model. Even if the reference did assign rock properties in the velocity model, we would be skeptical that the passage teaches or would have suggested assigning values for at least one rock property in at least one initial frequency-passband model because the "Examiner agrees with the applicant that the velocity model is not a frequency passband model." (Final Rej. 4.)

## VI. CONCLUSION

The Examiner does not allege, let alone show, that the addition of Gelfand, Jones, or AAPA cures the aforementioned deficiency of Etgen. Absent a teaching or suggestion of assigning values for at least one rock property in at least one initial frequency-passband model, we are unpersuaded of a *prima facie* case of obviousness.

## VII. ORDER

For the aforementioned reasons, we reverse the rejections of claims 1-29 under § 103(a).

**REVERSED**

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Keith A. Bell  
ExxonMobil Upstream Research Company  
P.O. Box 2189  
Houston TX 77252-2189